

REMARKS

This is intended as a full and complete response to the Office Action dated July 22, 2005, having an extended statutory period for response set to expire on November 22, 2005. Please reconsider the claims pending in the application for reasons discussed below.

In the specification, paragraph [0001] has been amended to reflect the issued United States patent.

Claims 1-32 remain pending in the application and are shown above. Claims 1-32 are rejected. Reconsideration of the rejected claims is requested for reasons presented below.

Claim 13 is canceled. Claims 1, 5-7, 15-19, 23, 26, 27, and 28 are amended for clarity. Claim 1 is amended to incorporate the subject matter of claim 13.

Claims 1, 3-6, and 8-12 stand rejected under 35 USC § 102(b) as being anticipated by *Tadashi, et al.* (Japan 10-324969). Applicant respectfully traverses the rejection. *Tadashi* deposits an aluminum containing film on a substrate and does not teach, show, or suggest using any other metal in its process. *Tadashi*, alone or in combination, does not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-6 and 8-12 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1-6 and 8-12 stand rejected under 35 USC § 103(a) over *Tadashi* in view of *Maniv, et al.* (US 4,392,931). Applicant respectfully traverses the rejection. *Tadashi* and *Maniv* deposit an aluminum containing film on a substrate and do not teach, show, or suggest using any other metal in its process. *Tadashi* and *Maniv*, alone or in combination, do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed

inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 2-6 and 8-12 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1 and 3-12 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Lantsman* (US 5,830,330). Applicant respectfully traverses the rejection. *Tadashi* deposits an aluminum containing film on a substrate and does not teach, show, or suggest using any other metal in its process. *Lantsman* does not indicate a specific metal for deposition, nor does it introduce a first and second process gas. *Tadashi* and *Lantsman*, alone or in combination, do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-12 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 3-6, and 8-14 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Ngan* (EP 0 840 351). Applicant respectfully traverses the rejection. *Tadashi* deposits an aluminum containing film on a substrate and does not teach, show, or suggest using any other metal in its process. *Ngan* does not indicate introducing process gas through locations proximate the target or the substrate surface. *Tadashi* and *Ngan*, alone or in combination, do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the

substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-6 and 8-14 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 3-6, 8-12, 15, and 16 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone* (US 6,451,184). Applicant respectfully traverses the rejection. *Tadashi* deposits an aluminum containing film on a substrate and does not teach, show, or suggest using any other metal in its process. *Sone* relies on a physical barrier to partition different regions of a chamber (See Figures 2 and 3). *Tadashi* and *Sone* alone or in combination, do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-6, 8-12, 15, and 16 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 3-6, 8-12, and 17 are rejected under 35 USC § 103(a) over *Tadashi*, in view of *Gilboa, et al.* (US 5,108,569). Applicant respectfully traverses the rejection. *Tadashi* deposits an aluminum containing film on a substrate and does not teach, show, or suggest using any other metal in its process. *Gilboa* provides gas in one location to the chamber. *Tadashi* and *Gilboa*, alone or in combination, do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-6, 8-12, and 17 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 3-6, 8-12, and 18 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Chikako, et al* (JP 06-041733). Applicant respectfully traverses the rejection. *Chikako* does not suggest applying power in the presence of only the first gas. *Tadashi* and *Chikako*, alone or in combination, do not teach, show, or suggest do not teach, show, or suggest introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, as recited in amended claim 1, and claims 3-6, 8-12, and 18 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 19, 21, and 26 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone*. Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Sone* relies on a physical barrier to partition different regions of a chamber (See Figures 2 and 3). *Tadashi* and *Sone*, alone or in combination, do not teach, show, or suggest creating a higher partial pressure of an inert gas inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber; initiating a plasma within the chamber; and creating a higher partial pressure of an active gas proximate the upper surface of the substrate than at the sputtering target, as recited in claim 19, and claims 21 and 26 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 20 is rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone* and *Maniv*. Applicant respectfully traverses the rejection. *Tadashi* and *Maniv* provide no pressure differences within their chambers. *Sone* relies on a physical barrier to partition different regions of a chamber (See Figures 2 and 3). *Tadashi*, *Sone*, and *Maniv*, alone or in combination, do not teach, show, or suggest creating a higher partial pressure of an inert gas inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber; initiating a plasma within the chamber; and creating a higher partial pressure of an active gas

proximate the upper surface of the substrate than at the sputtering target further comprising biasing a coil and the substrate, wherein the coil is disposed between the sputtering target and the substrate, as recited in claim 20. Withdrawal of the rejection is respectfully requested.

Claims 22 and 23 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone* and *Ngan*. Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Sone* relies on a physical barrier to partition different regions of a chamber (See Figures 2 and 3). *Ngan* does not indicate introducing process gas through locations proximate the target or the substrate surface. *Tadashi*, *Sone*, and *Ngan*, alone or in combination, do not teach, show, or suggest creating a higher partial pressure of an inert gas inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber; initiating a plasma within the chamber; and creating a higher partial pressure of an active gas proximate the upper surface of the substrate than at the sputtering target, as recited in claim 19, and claims 22 and 23 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 24 is rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone* and *Gilboa*. Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Sone* relies on a physical barrier to partition different regions of a chamber (See Figures 2 and 3). *Gilboa* provides gas in one location to the chamber. *Tadashi*, *Sone*, and *Gilboa* alone or in combination, do not teach, show, or suggest creating a gap between a shield ring and a shield support member when the shield ring is supported by a substrate support member, wherein the shield ring, the shield support member and the substrate support member are disposed inside the vacuum chamber, and introducing the active gas through the gap to the upper surface of the substrate, as recited in claim 24, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 25 is rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone* and *Chikako*. Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Sone* relies on a physical barrier to partition different regions of a chamber. *Chikako* also relies on a physical barrier, differential pressure

plate 18, to partition different regions of a chamber (paragraphs 14-18). *Tadashi*, *Sone*, and *Chikako*, alone or in combination, do not teach, show, or suggest creating a higher partial pressure of an inert gas inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber; initiating a plasma within the chamber; and creating a higher partial pressure of an active gas proximate the upper surface of the substrate than at the sputtering target, wherein creating the higher partial pressure of the active gas proximate the upper surface of the substrate comprises introducing the active gas through an inlet port centrally disposed through a substrate support member configured to support the substrate, as recited in claim 25, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 27 is rejected under 35 USC § 103(a) over *Tadashi* in view of *Sone*, *Ngan*, and *Maniv*. Applicant respectfully traverses the rejection. *Tadashi* and *Maniv* provide no pressure differences within their chambers. *Sone* relies on a physical barrier to partition different regions of a chamber. *Ngan* does not indicate introducing process gas through locations proximate the target or the substrate surface. *Tadashi*, *Sone*, *Ngan*, and *Maniv*, alone or in combination, do not teach, show, or suggest creating a higher partial pressure of argon inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate, wherein the coil is made of a material selected from a group consisting of titanium, tantalum and tungsten, creating a higher partial pressure of nitrogen proximate the upper surface of the substrate than at the sputtering target, and biasing the coil and the substrate, as recited in claim 27. Withdrawal of the rejection is respectfully requested.

Claims 28 and 29 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Takehara* (US 5,340,459). Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Takehara* does not suggest a partial pressure differential within the chamber. *Tadashi* and *Takehara*, alone or in combination, do not teach, show, or suggest introducing a gas mixture into a vacuum

chamber proximate a sputtering target disposed inside the vacuum chamber, creating a higher partial pressure of an inert gas inside the vacuum chamber proximate the sputtering target disposed therein than at an upper surface of the substrate, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate, and introducing a second gas into the chamber proximate the upper surface of the substrate, as recited in amended claim 28, and claim 29 dependent thereon. Withdrawal of the rejection is respectfully requested.

Claim 30 is rejected under 35 USC § 103(a) over *Tadashi* in view of *Takehara* and *Maniv*. Applicant respectfully traverses the rejection. *Tadashi* and *Maniv* provide no pressure differences within their chambers. *Takehara* does not suggest a partial pressure differential within the chamber. *Tadashi*, *Takehara*, and *Maniv*, alone or in combination, do not teach, show, or suggest introducing a gas mixture into a vacuum chamber proximate a sputtering target disposed inside the vacuum chamber, creating a higher partial pressure of an inert gas inside the vacuum chamber proximate the sputtering target disposed therein than at an upper surface of the substrate, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate, and introducing a second gas into the chamber proximate the upper surface of the substrate further comprising biasing the substrate and the coil, as recited in claim 30. Withdrawal of the rejection is respectfully requested.

Claims 31 and 32 are rejected under 35 USC § 103(a) over *Tadashi* in view of *Takehara* and *Ngan*. Applicant respectfully traverses the rejection. *Tadashi* provides no pressure differences within its chamber. *Takehara* does not suggest a partial pressure differential within the chamber. *Ngan* does not indicate introducing process gas through locations proximate the target or the substrate surface. *Tadashi* in view of *Takehara* and *Ngan*, alone or in combination, do not teach, show, or suggest introducing a gas mixture into a vacuum chamber proximate a sputtering target disposed inside the vacuum chamber, creating a higher partial pressure of an inert gas inside the vacuum chamber proximate the sputtering target disposed therein than at an upper surface of the substrate, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate, and introducing a second gas into the chamber proximate the upper surface of the substrate, as recited in claim 28,

and claims 31 and 32 dependent thereon. Withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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